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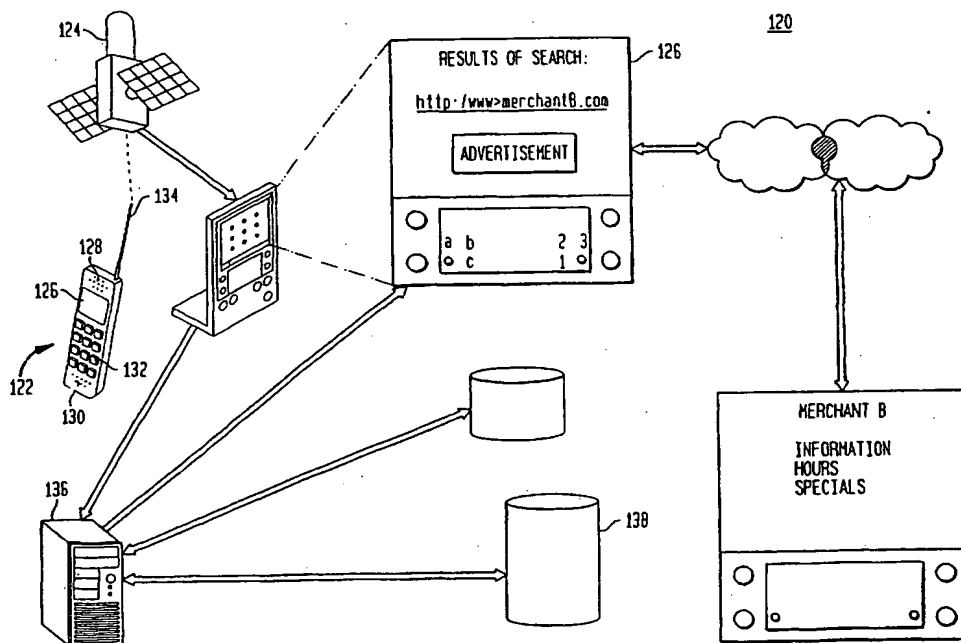
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ance Notes on Codes and Abbreviations" appearing at the begin-
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(54) Title: LOCATION SPECIFIC MARKETING USING GPS



(57) Abstract: A method of providing competitive advertisements to a mobile communication device includes determining a geo-graphic location of the mobile communication device (122), associating a first business with the geographic location, identifying a second business that provides a similar product or service as the first business, and sending one or more advertisements of the second business to the mobile communication device (122). The geographic location of the mobile communication device is determined using a global positioning system (GPS).

LOCATION SPECIFIC MARKETING USING GPSTechnical Field

The present invention is directed to telecommunications and is particularly directed to providing location-sensitive information to mobile communication devices.

Background Art

Individuals seeking information about local businesses have traditionally been provided with limited options. For example, signs and billboards are frequently used to indicate the presence of particular types of businesses, such as retail outlets, restaurants, gas stations and automatic teller machines. Newspapers, magazines and travel books may also be used to obtain information about businesses. In many instances, however, the above-noted resources are not readily available to individuals traveling through a particular area. Thus, there is a recognized need to provide marketing and sales information to such individuals.

Today, such marketing and sales efforts include location-sensitive marketing directed to mobile communication devices such as by using wireless telecommunication systems to contact consumers where and when they shop. In one such system, consumers desiring to participate in location-sensitive marketing are required to provide either their zip code or street address of their current location. Upon doing so, these consumers are presented with local business directories listing the nearest retail outlets, such as automatic teller machines, gas stations and theatres. Some of these location-sensitive marketing efforts offer video, audio and/or textual advertisements.

The proliferation of mobile communication devices has resulted in location-sensitive marketing efforts becoming more

aggressive. Many of these mobile communication devices use global positioning system (GPS) technology, which allows merchants to target consumers carrying cell phones, hand held computers, or other mobile devices.

5 U.S. Patent 6,014,090 to Rosen et al. discloses a system for providing time-dependent, geographically localized information to a mobile communication system. A geographic location identifier associated with a location of the mobile communication system is received and an address of a resource
10 server is associated with the geographic location identifier. The resource server stores time-dependent, geographically localized information that is sent to the mobile communication system over a telecommunications network.

In spite of the above-mentioned advances, there
15 remains a need for improved location-sensitive marketing efforts.

Summary of the Invention

In accordance with certain preferred embodiments of the present invention, a method of providing competitive
20 advertisements to a mobile communication device includes determining a geographic location of the mobile communication device, is preferably determined by identifying the geographic coordinates of the device. In certain preferred embodiments, the mobile communication device includes a global positioning
25 system (GPS) for determining the geographic coordinates. The mobile communication device preferably has a global positioning system chip or integrated circuit that enables the specific latitude and longitude coordinates of the mobile communication device to be determined. In particular preferred embodiments,
30 the GPS chip also enables the altitude or height of the mobile communication device above means sea level to be determined.

After the geographic coordinates of the mobile communication device have been determined, a first business is associated with the geographic coordinate. In one particular preferred embodiment, the geographic locations of businesses and/or residences are entered into a database. For each business, the database desirably includes the latitude, longitude and height above mean sea level. The database preferably includes a protocol for comparing geographic coordinates received from a mobile communication device with the geographic coordinates for the businesses stored in the database. Upon receiving the coordinates from the mobile communication device, a server or processor may retrieve the stored information regarding the particular business located at the geographic coordinates. The database may also include a group of businesses that provide similar products or services as the business located at the geographic location. The other businesses in the database may be referred to as competing businesses. The processor preferably identifies a second business that provides a similar product or service as the first business located at the geographic coordinates. After the second business has been identified, one or more advertisements of the second business may be sent to the mobile communication device.

In certain preferred embodiments, the geographic location of the mobile communication device is sent to a content provider or server via a wireless telecommunications link. The mobile communication device may be a mobile phone, a personal digital assistant, a pager, a radio or a wireless application protocol (WAP-enabled) telephone. The mobile communication device may also be any other electronic device capable of communicating over a wireless telecommunications link. The advertisements may be provided in a form that

includes audio content, video content and/or textual content. The advertisements may be provided in an analog or digital format.

In certain preferred embodiments, the first and second businesses that provide similar products or services may be located in the vicinity of one another. For example, the first and second businesses may be located within the same retail outlet. The first business may be located in one portion of an aisle of a retail outlet and the second business may be located in the same aisle, adjacent the first business. In other embodiments, however, the first and second businesses providing similar products or services do not have to be located in the same general vicinity. For example, when a mobile communication device is carried by a user into a retail outlet that sells books, the present invention enables a competitor of the bookstore to send competing advertisements to the mobile communication device. In one embodiment, a user enters a Barnes & Noble Bookstore. Upon entering the Barnes & Noble Bookstore, the GPS chip of the mobile communication device sends the geographic coordinates of the device to a server. The server then compares the geographic coordinates sent by the mobile communication device with a database of information on businesses so as to identify the business at which the mobile communication device is located. The information provider will then analyze the type of business genre of the Barnes & Noble Bookstore and select one or more businesses that compete with Barnes & Noble. For example, the information provider may select advertisements provided by Amazon.com. The Amazon.com advertisements will desirably be sent to the mobile communication device so long as the mobile communication device is located within the physical parameters of the Barnes & Noble bookstore. Thus, the present invention

enables a competitor to send advertisements to a mobile communication device when the user of a mobile communication device is located within the physical boundaries of a competing business. In other preferred embodiment, the competing advertisements may be sent when the mobile communication device is merely within the vicinity of the physical boundaries of the first business.

In other preferred embodiment of the present invention, a method of providing advertisements to a mobile communication device includes compiling a velocity record of the mobile communication device, using the velocity record to predict one or more geographic locations that the mobile communication device is likely to pass at a future point in time, and identifying one or more businesses associated with the one or more predicted geographic locations. Advertisements about businesses associated with the one or more geographic locations are then sent to the mobile communication device. The velocity record desirably includes information about one or more past geographic locations and a present geographic location of the mobile communication device. The velocity record may also include information about a path of travel between the past and present geographic locations of the mobile communication device. Preferably, the velocity record enables an information provider or server to track the movements and/or the rate of movement of an individual carrying a mobile communication device. Thus, the information provider can analyze the velocity record of the mobile communication device so as to predict future geographic locations of the mobile communication device. Based upon the predicted future locations, the information provider or server will select one or more business locations that the user of the mobile communication device is likely to pass in the near future. The

server will then select advertisements linked with the businesses at the one or more business locations. In preferred embodiments, the advertisements are desirably sent from the information provider to the mobile communication device before
5 the user of the mobile communication device is scheduled to arrive at the future geographic location. The mobile communication device in this particular embodiment of the present invention is adapted to receive and send information over a wireless telecommunication link. The mobile
10 communication device is preferably selected from the group consisting of a mobile telephone, a personal digital assistant, a pager, a radio, and/or a wireless application protocol (WAP-enabled) telephone.

These and other preferred embodiments of the present
15 invention will be described in more detail below.

Brief Description of the Drawings

FIG. 1 shows the components of a system for providing location-sensitive information to a mobile communication device, in accordance with certain preferred embodiments.

20 FIG. 2 shows the components of a system for providing location-sensitive information to a mobile communication device, in accordance with another preferred embodiment of the present invention.

FIG. 3 shows a system that provides location-sensitive information to a mobile communication device based
25 upon the velocity record of the device, in accordance with other preferred embodiments of the present invention.

FIG. 4 shows a schematic view of the mobile communication device of FIG. 3 traveling along a path.

30 Best Mode of Carrying Out Invention

Referring to FIG. 1, a system 20 for transmitting location-sensitive information, such as marketing information

and advertisements, to a mobile communication device 22 includes one or more satellites 24 in communication with mobile communication device 22. Mobile communication device 22 is preferably selected from the group of devices including mobile or cellular phones, personal digital assistants, pagers, radios and wireless application protocol (WAP-enabled) telephones. Mobile communication device 22 desirably includes a display screen 26, a speaker 28, a microphone 30 and one or more data entry keys 32. Mobile communication device 22 also desirably includes an antenna 34 for transmitting and receiving information to satellite 24. In certain preferred embodiments, mobile communication device may be a personal digital assistant 22A such as the device commonly sold under the trade name PALM PILOT.

Mobile communication device 22 preferably has a global positioning system (GPS) chip or integrated circuit that facilitates identifying the exact geographic coordinates for the device 22. Thus, in preferred embodiments the geographic coordinates of the mobile communication device 22 are determined by utilizing a global positioning system transmitter. The location may also be determined by entering an address of a location or a GPS location. A user may also use the data entry keys 32 to enter an alternate location other than the location at which the mobile communication device is located. The geographic location of mobile communication device 22 preferably includes the longitudinal, latitude and altitude coordinates at which the mobile communication device is located. The altitude coordinate preferably includes the height above mean sea level at which the device is located. The grid coordinates are preferably transmitted from mobile communication device 22 to a server 36 including a database 38

capable of associating grid coordinates with businesses located at or within the vicinity of the grid coordinates.

In preferred embodiments, the database 38 includes a list of businesses and the unique geographic location of each business. The database 38 may identify each business by genre or by the type of goods and services provided. As a result, the database may include groups of businesses, whereby the businesses in any one group compete with one another. In operation, when a geographic location is input into server 36, the server provides a list of businesses located at or in the vicinity of the geographic location. Server 36 then assembles and transmits location-sensitive information to mobile communication device 22. In one preferred embodiment, the location-sensitive information is provided over a wireless telecommunications network such as the Internet 42. The information provided preferably includes cyberspace addresses, such as URL's, of businesses located in the vicinity of the geographic location of the mobile communication device 22. In one preferred embodiment, the information provided on display screen 26 includes the web addresses of two merchants, namely merchant A and merchant B. The display screen 26 also includes an advertisement, preferably promoting either merchant A or merchant B. The information provided by merchant A may include sales or location information 46, hours of operation 48 or store specials or sales 50. A user of mobile communication device 22 may interact through key pads 32 so as to manipulate the information appearing upon visual display 26.

FIG. 2 shows another embodiment of the present invention wherein the advertisements of a competitor are provided to a mobile communication device. In FIG. 2, system 120 preferably includes mobile communication device 122 having display screen 126, speaker 128, microphone 130 and key pads

132 for entering information into device 122. Mobile communication device 122 also preferably includes an antenna 134 for transmitting and receiving information from satellite 124 and server 136. Server 136 has a database 138 stored
5 therein including businesses grouped by geographic location and by business type. As a result, for a given geographic location or coordinate, database 138 is able to provide a list of businesses located at or adjacent the geographic location. Database 138 is also able to provide subgroups of businesses
10 that sell similar products or services.

Mobile communication device 122 desirably includes a GPS chip that enables the exact geographic location of mobile communication device 122 to be determined. The exact geographic location of mobile communication device 122 is
15 transmitted to server 136. Upon receiving the geographic location, server 136 searches database 138 to determine the identity of the one or more businesses located at the reported geographic location of mobile communication device 122. After identifying a business operating at the reported geographic
20 location of mobile communication device 122, server 136 identifies one or more competing businesses that may or may not be co-located with the first identified business. Server 136 preferably provides advertisements or information about the one or more competing businesses to visual display 126. For
25 example, a user may carry mobile communication device 122 into a Barnes & Noble bookstore. Upon entering the Barnes & Noble bookstore, the GPS chip of mobile communication device 122 will receive information from satellite 124 regarding the exact geographic location of mobile communication device 122. Such
30 information is transmitted to server 136. Upon receiving the geographic location of mobile communication device 122, server 136 searches through database 138 to determine the identity of

a first business located at the geographic location. Server 138 then identifies a group of businesses that provide similar products or services as the business at which mobile communication device 122 is located. Server 138 then sends one or more advertisements of the competing businesses to visual display 126. The competing businesses may be rank-ordered for determining when their particular competing advertisements are displayed. For example, server 136 may send an advertisement provided by Amazon.com to the mobile communication device 122 so long as the user remains within the physical boundaries of the Barnes & Noble store. The competing advertisement seeks to divert a sale from Barnes & Noble to Amazon.com.

FIGS. 3 and 4 show a system for providing advertisements to a mobile communication device in accordance with further preferred embodiments of the present invention. The system generally receives information regarding the geographic location of the mobile communication device and transmits such information to a server in accordance with the methods described above. In FIG. 3, a velocity record of mobile communication device 222 is determined by tracking the direction and speed of travel of mobile communication device 222. Mobile communication device 222 preferably has a unique identifier that enables satellite 224 to track the movement of the device. At the location designated A, the GPS chip of mobile communication device 222 interfaces with satellite 224 so as to determine the exact geographic coordinates of the mobile communication device. The device 222 then moves in a direction indicated by arrow 260 until device 222 reaches location B. At location B, the GPS chip in device 222 once again interfaces with satellite 224 to record the exact geographic location of device 222. Although only two locations are shown, the frequency of the interface between the GPS chip

and the satellite may be increased so as to increase the number of location readings taken between location A and location B. As a result, a velocity record for mobile communication device 222 may be compiled. The highways, roads, streets, sidewalks and paths upon which mobile communication device 222 is likely to travel may also be recorded. In other words, all roads, highways and pathways and their grid coordinates may be recorded in a database. This information may be taken from previously prepared maps. The velocity record of mobile communication device 222 may be compared with the grid coordinates of the highways, roads, etc. recorded in the database so as to determine the likely route of travel of the mobile communication device. As a result, a server 236 may compare the recorded grid coordinates of the velocity record with the grid coordinates of the roads, highways, etc. As a result, the server may track the past movements of the mobile communication device, the present location of the mobile communication device and the rate of speed at which the mobile communication device has traveled between the prior locations and the present location. Based upon the velocity record, the server is preferably capable of predicting the future direction and rate of speed of the mobile communication device. Based upon the predicted future direction of travel and speed of the mobile communication device, the server selects one or more advertisements of businesses geographically located downstream of the present location of mobile communication device 222.

FIG. 4 shows one preferred embodiment of the system disclosed in FIG. 3 including highway 266, a first avenue 268, a second avenue 270 and service road 272. Highway 266 extends in a North-South direction and intersects with first and second avenues 268, 270. At second avenue 270, highway 266 turns to the right, extending in an East-West direction. Above the

intersection of highway 266 and second avenue 270, a service road 272 extends in a North-South direction. As shown in FIG. 4, mobile communication device 222 travels along highway 266 from location A, to location B and onto location C. The mobile communication device 222 remains in communication with Satellite 224 and server 236 as it moves along the designated travel route. At each location, the GPS chip provided within mobile communication device 222 receives updated information regarding the exact geographic coordinates at which mobile communication device is located. As mentioned above, the frequency of the information exchanged between satellite 224 and GPS chip may be increased so that the velocity record of mobile communication device is updated on a more frequent basis. Based upon the velocity record of mobile communication device 222, the system server 236 will compile velocity record information about device 222. For example, as mobile communication device 222 travels in a northerly direction along route 266, mobile communication device 222 may pass within the vicinity of retail establishments 274A-274E. For purposes of illustration, the retail outlets 274A-274E are deemed to be a chain of franchise operations such as Dunkin Donuts coffee shops. If a user desires to receive advertising information about Dunkin Donuts coffee shops when at location A, the server will transmit information to mobile communication device 222 about retail location 274B and 274C. However, the server 236 will not send information about retail outlet 274A because the velocity record of device 222 shows that device 222 has already passed retail outlet 274A and is headed in the direction of outlets 274B and 274C. Depending upon the rate of travel of device 222 along highway 266, the server 236 may only send information about retail outlet 274C. This may occur, because the server protocol, after analyzing the velocity record, may

calculate that mobile communication device 222 will already be past retail outlet 274B by the time information about outlet 274B is received by device 222. This calculation may be based upon the rate of travel of mobile communication device 222 along highway 266.

If a similar inquiry is made at location B, mobile communication device 222 may receive information about retail outlet 274D or retail outlet 274E. In certain preferred embodiments, server may recognize that mobile communication device 222 has traveled for a relatively long period of time along highway 266. Thus, server 236 may conclude that a user of mobile communication device 222 is unlikely to exit highway 266 onto service road 272. As a result, server 236 will not provide information regarding retail outlet 274D located on service road 272. Instead, server will predict that a user of mobile communication device 222 is likely to remain on highway 266, and will provide mobile communication device 222 with information only regarding retail outlet 274E. Thus, server 236 of the present invention may predict both the likely future path and likely velocity of the mobile communication device.

As mentioned above, at the intersection of second avenue 270 and highway 266, a user will remain on highway 266, traveling in an easterly direction. At location C, mobile communication device 222 will record its geographic location and transmit such location to server. Server will then update the velocity record of mobile communication device 222 and provide information about retail outlets located downstream of mobile communication device 222. Thus, at location C, mobile communication device 222 will receive information regarding retail outlet 274E. However, device 222 will not receive information about retail outlet 274C because outlet 274C has

already been passed and is located upstream of the direction of travel of device 222.

Although the present invention has been described with reference to particular preferred embodiments, it is to be understood that the embodiments are merely illustrative of the principals and application of the present invention. It is therefore understood that numerous modifications may be made to the preferred embodiments of the present invention without departing from the spirit and scope of the present invention as defined by the claims.

Claims:

1. A method of providing competitive advertisements to a mobile communication device comprising:

determining a geographic location of said mobile communication device;

associating a first business with said geographic location;

identifying a second business that provides a similar product or service as said first business; and

sending one or more advertisements of said second business to said mobile communication device.

2. The method as claimed in claim 1, wherein the determining a geographic location of said mobile communication device includes using a global positioning system (GPS) for determining geographic coordinates of said mobile communication device.

3. The method as claimed in claim 2, wherein said geographic coordinates include latitude and longitude coordinates of the geographic location of said mobile communication device.

4. The method as claimed in claim 1, further comprising sending the geographic location of said mobile communication device to a content provider of information including advertisements via a wireless telecommunications link.

5. The method as claimed in claim 4, wherein said mobile communication device includes a global positioning system integrated circuit.

6. The method as claimed in claim 5, wherein said mobile communication device includes a device selected from the group consisting of a mobile phone, a personal digital assistant, a pager, a radio and a wireless application protocol (WAP-enabled) telephone.

7. The method as claimed in claim 1, wherein the associating a first business with said geographic location comprises:

compiling a database of businesses;

5 establishing geographic coordinates for each business in said database of businesses, wherein each said business has unique geographic coordinates assigned thereto.

8. The method as claimed in claim 7, wherein said geographic coordinates includes latitude, longitude and height
10 above mean sea level.

9. The method as claimed in claim 7, wherein the identifying a second business that competes with said first business comprises grouping said businesses into business groups, wherein members of each said business group provide
15 similar products or services, and wherein said first and second businesses are grouped in a common business group.

10. The method as claimed in claim 1, wherein said advertisement are provided in a content selected from the group consisting of audio content, video content and textual content.

20 11. The method as claimed in claim 1, wherein said advertisements are provided in a content selected from the group consisting of digital audio content, digital video content and digital textual content.

25 12. The method as claimed in claim 1, wherein said first and second businesses provide a similar product or service.

13. The method as claimed in claim 1, wherein the geographic locations of said first and second businesses are in the vicinity of one another.

30 14. A method of providing advertisements to a mobile communication device comprising:

compiling a velocity record of said mobile communication device;

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using said velocity record to predict one or more geographic locations that said mobile communication device is likely to pass at a future point in time;

identifying one or more businesses associated with the predicted one or more geographic locations; and

sending advertisements about the identified one or more businesses to said mobile communication device.

15. The method as claimed in claim 14, wherein said velocity record includes information about a past geographic location and a present geographic location of said mobile communication device.

16. The method as claimed in claim 15, wherein said velocity record includes information about a path of travel between the past and present geographic locations of said mobile communication device.

17. The method as claimed in claim 16, further comprising calculating a rate of motion of said mobile communication device.

18. The method as claimed in claim 16, further comprising predicting a future geographic location of said mobile communication device using the velocity record of said mobile communication device and selecting advertisements based upon the predicted future geographic location of said mobile communication device.

19. The method as claimed in claim 18, further comprising sending said selected advertisements to said mobile communication device before said mobile communication device is predicted to arrive at said future geographic location.

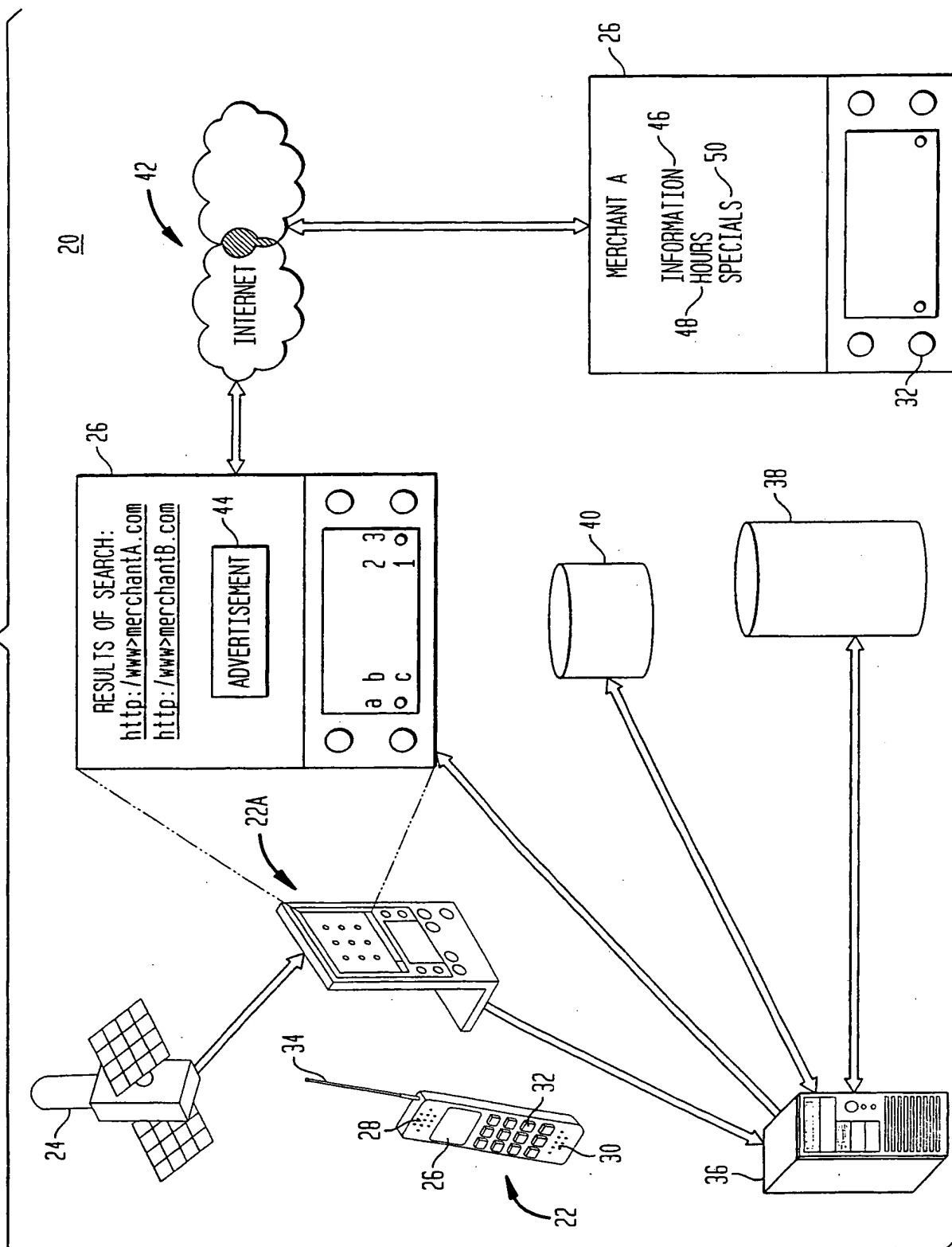
20. The method as claimed in claim 19, wherein said mobile communication device is adapted to receive and send information over a wireless telecommunications link, and wherein said mobile communication device is selected from the

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group consisting of a mobile telephone, a personal digital assistant, a pager, a radio and a wireless application protocol (WAP-enabled) telephone.

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FIG. 1



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FIG. 2

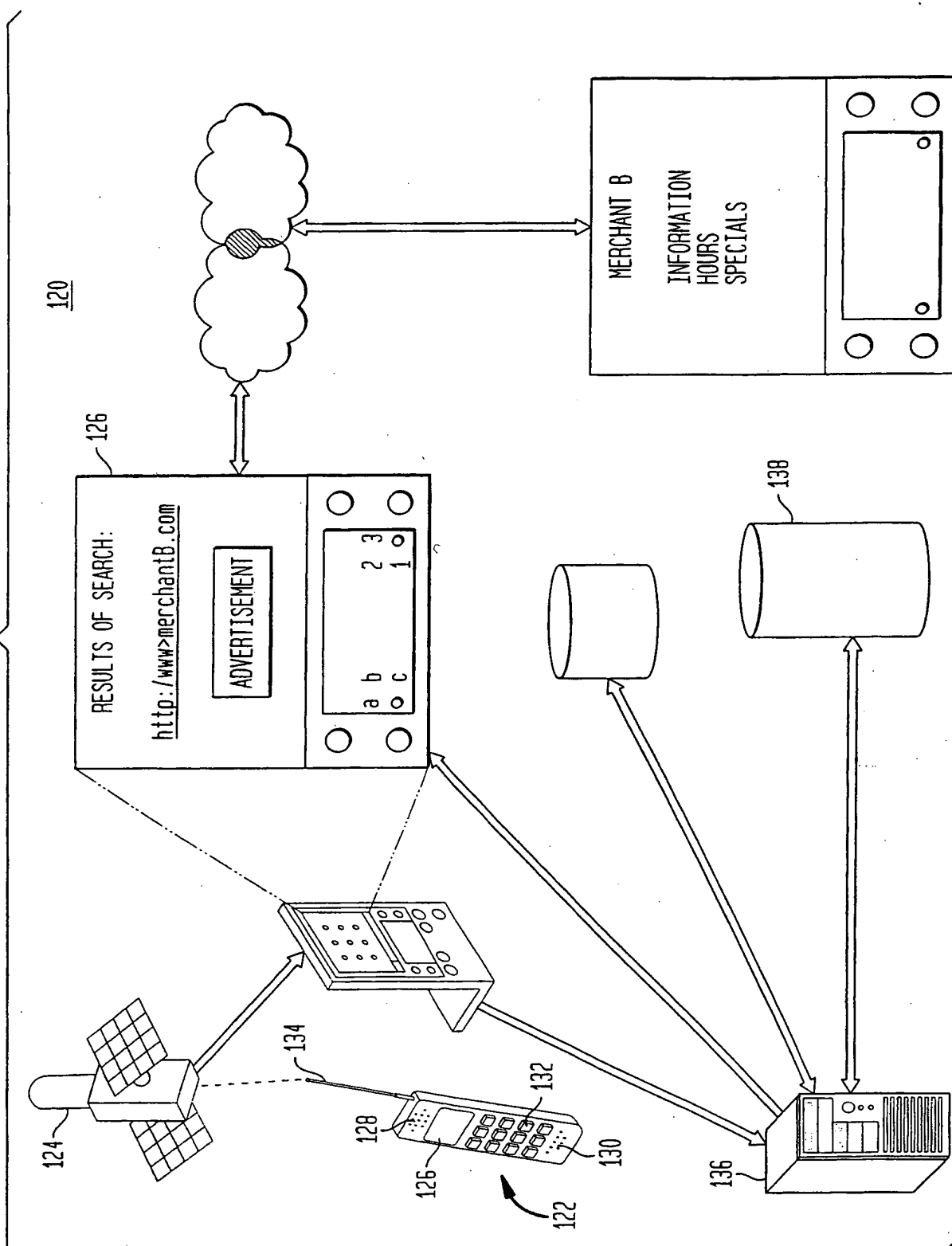


FIG. 3

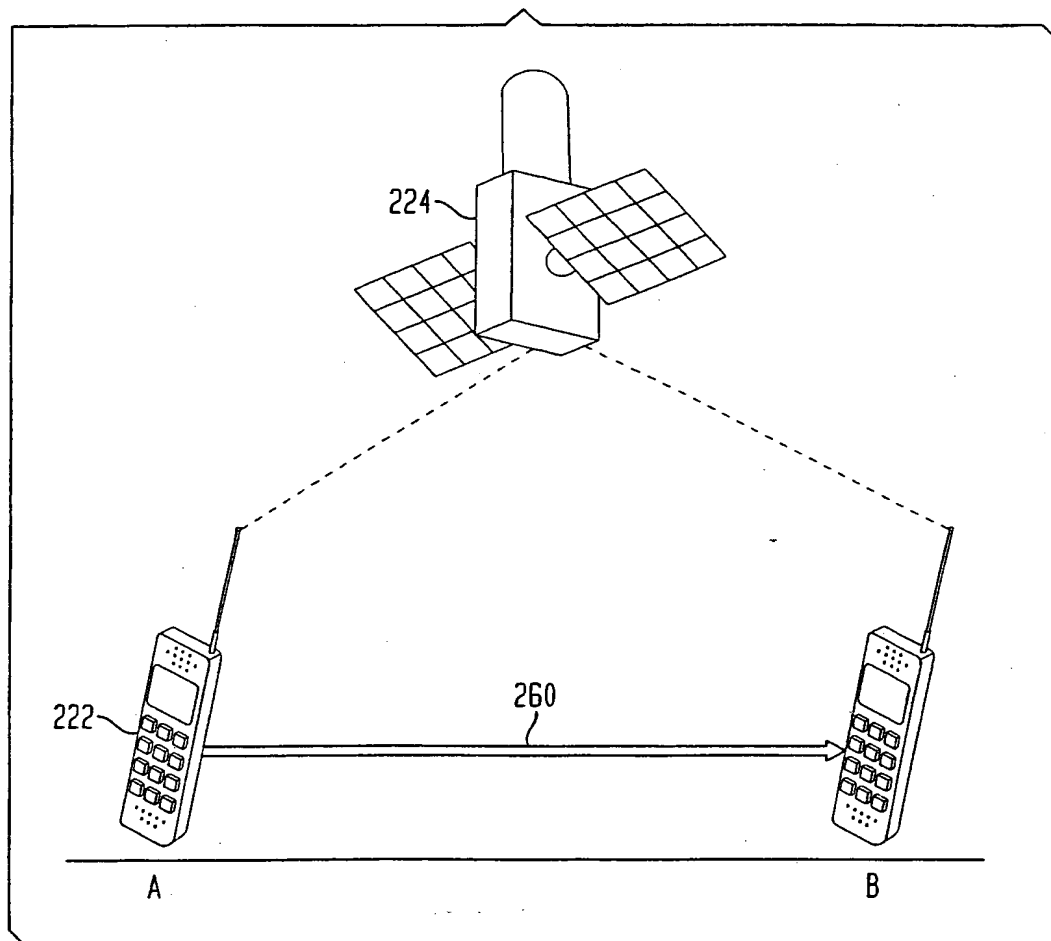
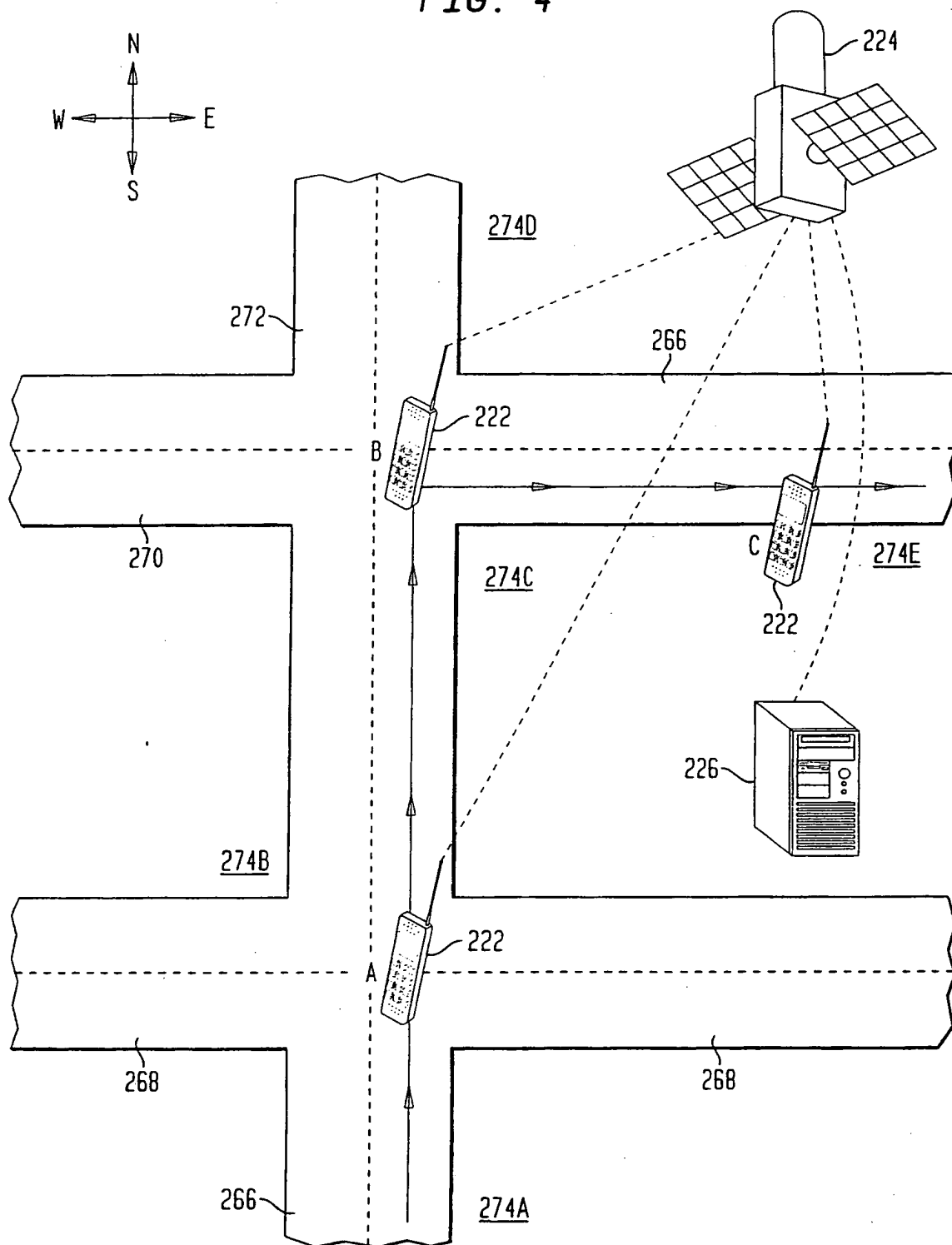


FIG. 4



SUBSTITUTE SHEET (RULE 26)

INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER

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US CL : 705/14; 434/307R

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 705/14; 434/307R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EAST

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5,664,948 A (DIMITRIADIS et al) 9 September 1997, the ABSTRACT, FIG. 1, FIG. 2, col. 3, ll. 9-27, and col. 4, ll. 8-23.	1-20
Y	US 6,013,007 A (ROOT et al) 11 January 2000, the ABSTRACT, FIG. 1A, FIG. 1B, FIG. 1C, FIG. 2, and FIG. 12.	1-13, 18-20
Y	US 5,752,186 A (MALACKOWSKI et al) 12 May 1998, the ABSTRACT, FIG. 4, FIG. 5, col. 6, ll. 60-67, and col. 7, ll. 1-2.	6, 14-18 and 20

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

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Date of the actual completion of the international search

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